

## Potato Leafhopper

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Potato leafhopper (PLH) is a common economically important insect pest in alfalfa hay production, especially in southern Minnesota and Wisconsin. Infestations are less common in northern Minnesota, North Dakota, and South Dakota. This pest does not overwinter in northern states, but migrates from southern areas on the strong southerly winds that occur each spring. Last year was a low infestation year whereas 2003 was a severe infestation year, even in the Dakotas, probably due to differences in the wind patterns.

Potato leafhoppers are small (1/8"), green, wedge-shaped insects that suck plant juices from the phloem of alfalfa leaves. However when feeding, PLH secretes a toxin into the alfalfa plant that causes the vascular system to plug, reducing water and nutrient flow in the leaf. This creates a yellow, v-shaped chlorosis area on the tip of leaflets commonly called hopperburn. Severely damaged plants will have extensive leaf chlorosis and plants will be stunted.

Potato leafhopper infestation is most severe in seeding stands. An established stand takes about 6 weeks to develop the first harvest. An early harvest usually allows the stand to avoid extensive PLH damage because the leafhoppers generally have not arrived or built to a high level yet. It takes about 9-10 weeks for alfalfa to emerge and develop the first harvest during the seeding year; therefore, the plants are exposed to the ravishes of the insect longer. Early severe infestation in the seeding year may kill unprotected susceptible varieties or more commonly causes up to 30-40% yield losses.

Alfalfa stands may experience yield and quality losses from PLH before any yellowing is visible; therefore, scout fields using an insect sweep net to detect the insect before symptoms appear. Take 10 sweeps in several areas of the field and count the adult and nymph leafhoppers present. The conventional thresholds that should be used to determine if spraying is necessary in PLH-susceptible varieties are given in Table 1.

**Table 1.** *Threshold for when spraying for PLH is recommended*

| Stem Height<br>(inches) | PLH/<br>Sweep |
|-------------------------|---------------|
| >3                      | 0.2           |
| 6                       | 0.5           |
| 8-10                    | 1.0           |
| 12-14                   | 2.0           |

Control of PLH is critical during the seeding year. Serious infestations in the seeding year can reduce forage yield for the life of the stand.

Varietal resistance to PLH has been improving since its first commercial release in 1997. Resistance is associated with the glandular-haired characteristic, or specialized hairs found on the stems and leaves that produce exudates. Mechanisms of plant resistance: 1) antibiosis or exudates are toxic to the insect, 2) non

preference or the insect will go elsewhere if given a choice, or 3) tolerance or plants withstand more injury without yield loss.

Varietal resistance to PLH has improved greatly since the first releases. Fifth generation varieties now have greater than 75% of the plants resistant to PLH. In addition, significant improvement has been made in the agronomics of PLH-resistant varieties including improvements in yield, recovery after cutting, persistence, dormancy level, and disease resistance. Forage quality may also be affected by the glandular-hair characteristic. Dry matter intake and rate of digestion were substantially higher in at least one glandular-hair experimental.

If you have a PLH-resistant variety with less than 50% of the plants resistant (releases in the late 1990's), be sure to scout the fields and determine the infestation rate. Heavy infestations will cause damage in even these varieties. If highly resistant PLH varieties are used (ones with >50%), using a threshold three times higher than for susceptible varieties would be a conservative approach. However, the data suggest that highly resistant PLH varieties (>75%) may be to the point that no spraying treatment will be necessary in established stands.

Contact your county agent for information on PLH-resistant varieties that have performed well in your area and recommended insecticides for control of PLH if this becomes necessary.